Discrete Mathematics Quiz 2 2020-5-28

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Student Number \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

1、 (3%) Find the next larger permutation in lexicographic order after 1375642.

(3%) Find the next largest 4-combinations of the set {1, 2, 3, 4, 5, 6, 7, 8} after {1, 2, 3, 8}.

2、How many relations are there on a set with n elements that are

1. (4%) both symmetric and antisymmetric?
2. (8%) neither symmetric nor antisymmetric?

3、(6%) a) How many ways are there to distribute 5 balls into 8 boxes, both the balls and boxes are labeled?

(6%) b) How many ways are there to distribute 5 balls into 8 boxes, if each box must have at most one ball in it, and the balls are labeled but the boxes are unlabeled?

(6%) c) How many ways are there to distribute 24 balls into 8 boxes, if the balls are unlabeled, but the boxes are labeled, and each box must have at least 1 balls in it?

(6%) d) How many ways are there to distribute 5 balls into 8 boxes, if each box must have at most one ball in it, and the balls are unlabeled but the boxes are labeled?

(6%) e) How many ways are there to distribute 8 balls into 5 boxes, if no box can be left empty, both the balls and boxes are labeled?

4、(6%) The coefficient of in the expansion of is

5、(6%) Let *a*1 2, *a*2 9, and *an* 2*an* 1 3*an* 2 for *n* 3. Then

6、(6%)Suppose |A| = |B| = |C| = 100, |A∩ B| = 60, |A ∩ C| = 50, |B ∩ C| = 40, and |ABC| = 175. How many elements are in A∩ B∩ C?

7、(6%) Find the number of solutions of ,where are integers,

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8、(8%) Select 3 numbers from 1, 2，… , 100 such that the sum of these 3 numbers must be divided by 4. Then the total number of different selection ways is\_\_

9、(6%) If G(x) is the generating function for a0,a1,a2,a3,…, describe in terms of G(x) the generating function for a0,2a1,4a2,8a3,16a4,….

10、(8 %) Use generating functions to solve the recurrence relation with initial conditions a0 = 6 and a1 = 30.

11、(6%)Assume that the characteristic equation for a homogeneous linear recurrence relation with constant coefficients is (r −5) (r + 5)2 = 0. Describe the form for the general solution to the recurrence relation.